Minnesota Pollution Control Agency

PRELIMINARY ASSESSMENT
EXECUTIVE SUMMARY

Valentine - Clark Corporation
MND 981526486
September 18, 1986

Situation

The Valentine-Clark Corporation Site (Site) is located in St. Paul, Minnesota. The Corporation operated a wood treating facility at this Site from about 1910 to the late 1950's. Poles were treated with pentachlorophenol and creosote, and residues from these compounds were allegedly disposed of in a swamp located on the property. Reportedly, the former Minneapolis Moline Company located north of the Site also dumped waste chemicals into this swamp. A metalscrap company now occupies the Site.

There are no municipal drinking water wells located within a 3-mile radius of the Site, and the existence of private water supplies is unknown. Bridal Vale Creek flows along the west side of the Site.

Inspections Priority Recommendations

The Minnesota Pollution Control Agency (MPCA) staff have conducted a Preliminary Assessment for Valentine - Clark Corporation. As a result, the Agency staff believe that the Site represents a low potential hazard to the environment because disposal problems have been documented, but ground water contamination has not been verified and the possibility of affecting drinking water supply wells is unlikely. In conclusion, the MPCA staff hereby recommend that the Site be assigned a medium priority for inspection because hazardous waste is known to have been on-site with the potential to contaminate ground water and/or surface water.

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Phone:_____
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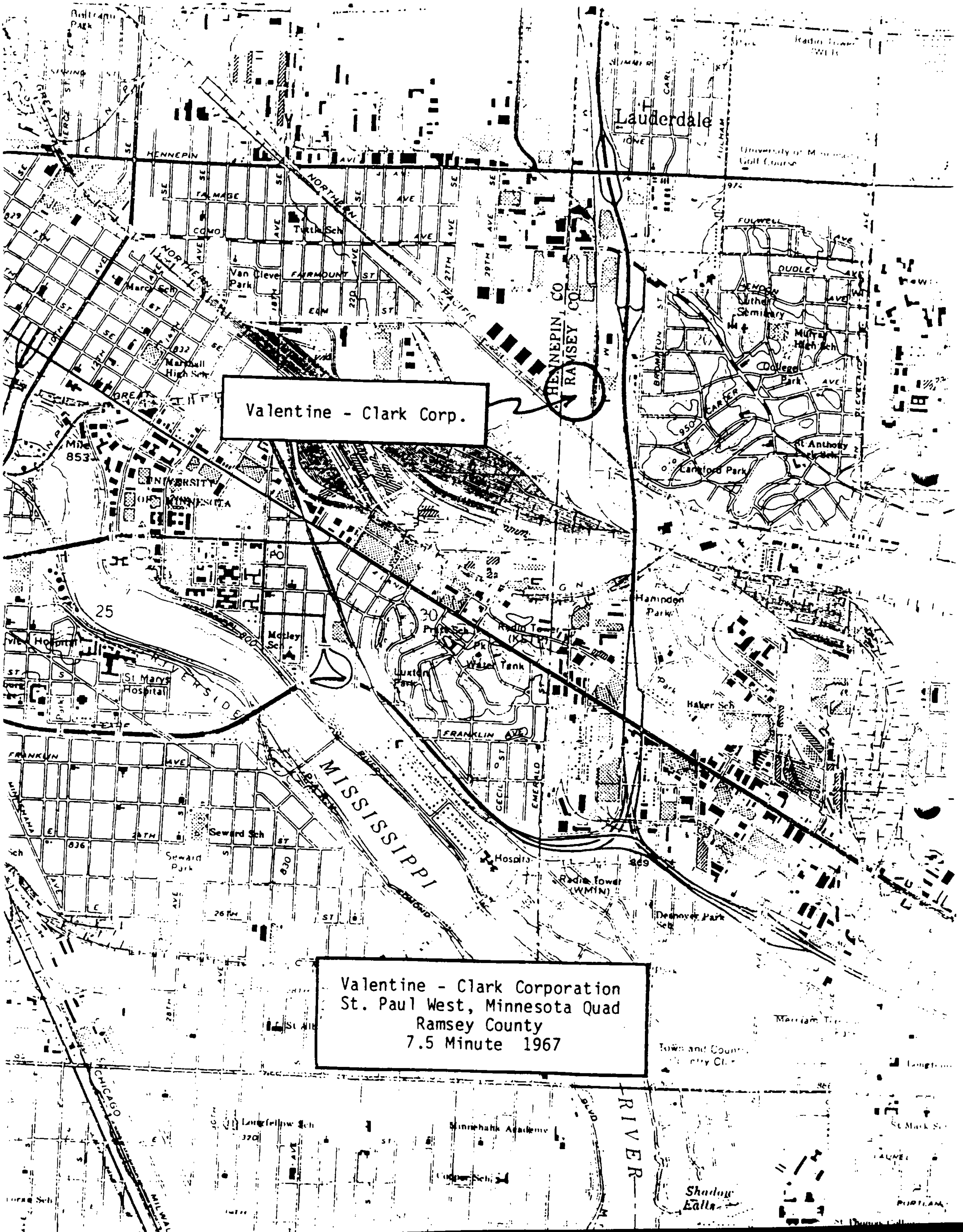
Valentine - Clark Corp.
Valentine - Clark Corporation
St. Paul West, Minnesota Quad
Ramsey County
7.5 Minute 1967
Lauderdale
HENNEPIN CO
RAMSEY CO
MISSISSIPPI
RIVER
HENNEPIN AVE
Marshall High Sch
UNIVERSITY OF MINNESOTA
Van Cleve Park
St Marys Hospital
Seward Sch
Seward Park
Motley Sch
Luxton Park
Water Tank
Hampden Park
Baker Sch
College Park
Lauderdale
Longfellow Sch
Minnehaha Academy
Cooper Sch
Shadow Falls
FRANKLIN AVE
CHICAGO

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MN	D 981526486

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Quality Metals Inc.		2575 Doswell Avenue		St. Paul	MN	55108
Lapham-Hickey Steel		2576 Doswell Avenue		St. Paul	MN	55108

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
N/A						
N/A						

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Valentine-Clark Corporation		2516 Doswell Avenue		St. Paul	MN	55108
Williaume Steel Company		2576 Doswell Avenue		St Paul	MN	55108
Gate City Steel Corporation		2576 Doswell Avenue		St. Paul	MN	55108

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
N/A						
N/A						
Valmont Industries				Valley	NB	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Investigation of the Lapham-Hickey Steel Corp. Portion of the Valentine-Clark Site, Located in St. Paul, Minnesota by Yates & Auberle, Ltd, January 9, 1989

ecology and environment, inc.
111 WEST JACKSON BLVD . CHICAGO. ILLINOIS 60604. TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: September 25, 1987
TO: File
FROM: Kenneth E. Dulik
SUBJECT: Minnesota/F05-8704-075/FMN0120SA
St. Paul/Valentine Clark Corp.
MND981526486

The Valentine Clark Corp. had operated a wood treating facility located at 2575 and 2576 Doswell Avenue, St. Paul, Minnesota (sec.20,T.29N.,R.23W.). The facility treated poles with pentachlorophenol (PCP) and creosote. Residues from these compounds were dumped in an on-site wetland area. The wetland area has been filled with demolition material. The site was discovered through a public complaint in 1983 to the Minnesota Pollution Control Agency (MPCA).

The site was owned and operated by the Valentine Clark Corp. from 1910 to approximately 1956. The company is now defunct, and no representatives could be found to interview. There have been no past emergency response actions taken at the site.

Approximately one-third of the site is currently owned and operated by Lapham-Hickey Steel. The remainder of the site is currently owned and operated by Quality Metals. Lapham-Hickey Steel cuts finished steel and ships the finished product off-site. Quality Metals is a storage facility of scrap steel.

Lapham-Hickey Steel's property is completely fenced. Quality Metals has fencing only on the east side of its property. The Bridal Veil

Creek borders the site to the west and is a tributary to the Mississippi River. There is no barrier to the site north of Quality Metals.

Pavement and buildings occupy almost one-half of the site, while a few trees, sparse grass, and rocks and gravel cover the remainder of the site. The site is level with the surrounding terrain except for a fill mound in the southwest section.

The site is located in an industrial area. A railroad yard is located to the southwest, and warehouses are located to the east and north. There is an open field to the west which separates the site from other industrial facilities. There is a residential area 1/4 mile east of the site.

The site was not lined nor capped when closed. Groundwater flow is southwest toward the Mississippi River, which is 1.2 miles away.

On June 17 and 18, 1987, an Ecology and Environment, Inc., Field Investigation Team (E & E-FIT) conducted an inspection at the Valentine Clark Corp. site. The purpose of the inspection was to interview site representatives, collect soil samples, and observe present conditions at the site. Seven soil samples were taken in accordance with work plan directives. Samples were not split with site representatives. There were no water samples taken because there are no downgradient wells near the site. Soil samples S1 and S5 were taken at a depth of 4 to 6 feet using a cathead and split-spoon sampler. The remainder of the samples were collected at the surface.

Several organic and inorganic contaminants were detected at varying levels in all soil samples (refer to Tables 1 and 2). Soil sample S3 was analyzed at medium concentration for volatile and semivolatile compounds. Soil sample S3 was taken at the edge of the Bridal Veil

Creek, downstream from S4. Soil sample S4 was taken on the north corner of the site and revealed very little contamination compared to S3.

There were contaminants detected in the two background samples not detected in on-site samples. The background samples were collected in an agricultural area.

Laboratory analyses indicate on-site soil is contaminated and that contaminants are migrating off site via Bridal Veil Creek. The extent of soil contamination is not known, but previous soil sampling by a private contractor revealed contamination of soil as deep as 15 feet. There is a high probability that groundwater beneath the site is contaminated, since the water table is shallow and is located in a sand and gravel drift aquifer overlying a shale bedrock layer. To obtain an observed release to groundwater, monitoring wells would have to be installed. Because of known soil contaminants, the site poses a health hazard to the population within a 3-mile radius.

24Y:4X(2)

Table 1

CONTAMINANTS FOUND IN SOIL SAMPLES

Contaminant	S1	S2	S3	S4	S5	S6	S7
ug/kg							
1,1,2,2-Tetrachloroethane	--	*	--	--	--	--	--
Benzene	--	--	*	--	--	--	--
4-Methyl-2-Pentanone	--	--	63	--	--	--	--
Toluene	*	*	57	--	--	*	*
Ethylbenzene	--	*	41	--	--	--	--
Total Xylenes	--	--	210	--	--	--	--
1,3-Dichlorobenzene	--	*	--	--	--	--	--
[illegible]s(2-Chloroisopropyl)ether	--	*	--	--	--	--	--
Benzoic Acid	--	*	*	*	--	*	*
Napthalene	*	*	*	--	--	--	*
2-Methylnapthalene	*	--	2500000	--	--	--	*
Acenapthylene	*	--	*	--	--	--	*
Acenaphthene	*	--	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--	*
Dibenzofuran	*	--	1000000	--	--	--	--
2,6-Dinitrotoluene	--	--	--	--	--	540	--
Diethylphthalate	--	*	--	--	--	*	*
Fluorene	*	--	1600000	--	--	--	--
N-nitrosodiphenylamine	--	*	1400000	--	--	--	--
Pentachlorophenol	5500	*	--	--	--	*	*
Phenanthrene	990	*	21000000	*	*	*	350
Anthracene	1200	*	2200000	*	*	*	*
Fluoranthene	1600	*	--	330	370	*	600
Pyrene	1900	--	--	--	--	--	760
[illegible]tylbenzylphthalate	--	520	--	--	*	*	--
[illegible]enzo(a)anthracene	1400	*	--	*	*	*	400
Chrysene	1600	*	--	*	*	*	480
Di-n-octylphthalate	--	330	--	--	--	--	--
Benzo(b&k)fluoranthene	5900	640	--	--	430	440	820
Benzo(a)pyrene	2400	300	--	--	--	*	610
Indeno(1,2,3-cd)pyrene	2200	--	--	--	--	--	670
Dibenzo(a,h)anthracene	680	--	--	--	--	--	--
Benzo(g,h,i)perylene	2200	--	--	--	--	--	690
4,4'-DDE	--	--	--	--	--	*	2100
4,4'-DDT	--	--	--	--	--	200	1700

* Denotes Estimated Quantity
-- Not Detected

23X:5M

Table 2

CONTAMINANTS FOUND IN SOIL SAMPLES

Contaminant	S1	S2	S3	S4	S5	S6	S7
ug/kg							
Unsaturated Hydrocarbons	*	--	--	--	--	--	--
PAH's	*	--	*	--	--	--	--
Alcohol	*	*	*	*	*	--	*
Halogenated Hydrocarbons	--	--	*	--	--	--	--
Cyclic Hydrocarbons	--	--	*	--	--	--	--
Saturated Hydrocarbons	--	--	*	--	--	--	--
Sulfur Molecules	--	--	--	*	*	--	--
mg/kg							
Arsenic	--	--	18	--	--	--	6.6
Barium	--	.62	--	--	--	--	.62
Cobalt	5.8	5.2	--	5.1	--	5.7	3.4
Copper	18	46	63	25	31	19	14
Lead	*	*	*	*	*	*	*
Mercury	0.41	0.11	1.3	0.16	--	--	--
Nickel	18	22	17	15	12	18	11
Tin	--	--	--	9.7	--	--	--
Vanadium	19	23	16	22	11	21	17

* Denotes Estimated Quantity
-- Not Detected

EXECUTIVE SUMMARY

On June 22-24, 1988, and July 25-27, 1988, the Minnesota Pollution Control Agency (MPCA) staff conducted a Site Investigation Follow-up (SIF) at Valentine-Clark Corporation (Site) in St. Paul, Minnesota. The purpose of the SIF was to fill data gaps in the initial Site Investigation conducted by Ecology & Environment, Incorporated (E&E), during June of 1987. E&E had determined that Site soils were contaminated with polyaromatic hydrocarbons and pentachlorophenol, but E&E did not obtain any ground water samples.

Work conducted during the SIF consisted of sampling soils from four on-site soil borings advanced to the water table, and sampling of three on-site monitoring wells that were installed in three of the boreholes. In addition, two surface water samples and two stream sediment samples were taken from Bridal Veil Creek which flows along the western edge of the Site. Samples were analyzed for volatile organic aromatics (VOAs), acid base neutrals (ABNs), polychlorinated biphenyls (PCBs), pesticides, metals, and cyanide.

Laboratory analysis of soils from the Site revealed the presence of VOAs, polyaromatic hydrocarbons (PAHs), metals, common laboratory artifacts, and common soil constituents. Laboratory analysis of the surface water samples detected common laboratory artifacts and commonly occurring metals and heavy metals. On-site ground water samples were found to contain VOAs, PAHs, metals, and common ground water constituents. Pentachlorophenol and high concentrations of PAHs were detected in the downstream sediment sample and two of the four soil borings. Pentachlorophenol was detected in only the most downgradient of the three on-site wells.

2.0 INTRODUCTION

The MPCA, working under a Cooperative Agreement with the U.S. Environmental Protection Agency (EPA), conducted an SIF at Valentine-Clark Corporation in St. Paul, Minnesota. The Site is located at 2575 and 2576 Doswell Avenue (Sec. 20, T29N, R23W). The facility was used for many years for treating telephone and power line poles with creosote and pentachlorophenol.

According to a complaint received by the MPCA in 1983, residues from pole treating operations were dumped in an on-site wetland area. The wetland was later filled in with demolition debris. The MPCA staff placed the Site on EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) inventory on July 9, 1986. A Preliminary Assessment of the Site was completed by Shawn Ruotsinoja of the MPCA staff and was submitted to EPA on September 18, 1986.

An E&E Field Investigation Team (FIT) conducted a Site Investigation at the Valentine-Clark facility on June 17 and 18, 1987. E&E obtained seven shallow or surface soil samples at scattered locations across the Site.

The E&E Site Investigation Report raised concerns among MPCA staff, since PAH and pentachlorophenol contamination was found in soil samples, but no ground water sampling was conducted to assess the potential impacts on industrial wells in the area.

The MPCA staff proposed to conduct a Site Inspection Follow-up in January 1988. An SIF work plan, dated April 21, 1988, was submitted to EPA and approved. Site

access was obtained and the SIF was conducted during June and July of 1988, on the northern two-thirds of the Site, now owned by Quality Metals, Incorporated. The southern one-third of the Site was not investigated by MPCA staff because the owner, Lapham-Hickey Steel Corporation, was preparing to undertake their own site investigation of that parcel.

3.0 SITE BACKGROUND

3.1 Site Description

The site is located in an industrial area of St. Paul, in close proximity to rail lines and a major highway. The Site is bounded on the west by the Minneapolis-St. Paul City boundary, on the south by the Burlington Northern (formerly Northern Pacific Railway) tracks, on the east by the Minnesota Transfer Railway Company tracks, and on the north by the Portec Company-Pioneer Division property. State Highway 280 runs east of the Site. The nearest residential area is one-quarter mile east, just beyond Highway 280. Bridal Veil Creek enhances the western Site boundary, flowing from north to south near the property line (Figures I and II).

Asphalt pavement and buildings belonging to Quality Metals and Lapham-Hickey Steel occupy almost one-half of the Site. The Quality Metals parcel has large scrap metal piles, piles of fifty-five gallon drums, and vehicle storage areas to the north of its buildings. The remainder of the parcel is open, level land with normal vegetation, scattered trees, and areas of discarded household wastes and miscellaneous debris. Quality Metals is currently operating at the Site as a wholesaler of ferrous and non-ferrous metals and scrap iron.

The Lapham-Hickey Steel facility is completely fenced, with a process building and asphalt parking lot occupying approximately half of the parcel. The other half is open land with normal vegetation and scattered trees. The Lapham-Hickey property was closed down at the time of the SIF.

3.2 Site History

The Valentine-Clark Corporation owned and operated a wood preserving business on this 10-acre Site from approximately 1910 until 1962. Sanborn insurance maps and aerial photographs from 1945, 1958, and 1962 illustrate many of the features of the Valentine-Clark facility, including buildings, rail spurs, creosote storage tanks, pole treatment tanks, and pole storage areas. These photos are attached as Appendix H, and Sanborn insurance maps are included in Appendix I.

Information obtained from former Valentine-Clark employees indicated that pole treating was done with creosote compounds as preservatives. Sometime during the late 1940's or early 1950's, Valentine-Clark began using a five percent pentachlorophenol in fuel oil mixture for wood treating, in addition to using creosote. Aerial photos indicate areas of soil staining at the Site with creosote and/or fuel oil compounds, in and around areas where the poles were being treated and dried. The releases probably occurred from leaking creosote and fuel oil storage tanks, leaking treatment tanks, preservatives dripping off drying poles, and on-site disposal of treatment compounds.

Wood treating operations are believed to have ceased sometime during 1962. In June of 1962, ownership of the property was transferred from the Valentine-Clark

Corporation to Mr. Kenneth Sperry, a majority stockholder and Vice President in the Corporation. Also in 1962, the Site was vacated, all structures were dismantled, and the Site was covered with fill material. Valentine-Clark Corporation was voluntarily dissolved in 1963. In 1967, Mr. Kenneth Sperry sold the entire Site to Quality Metals, Incorporated.

Quality Metals constructed a building on the northern two-thirds of the Site in the fall of 1967, and divided the property into two parcels, with the vacated Doswell Avenue as the dividing line. Quality Metals then sold the southern one-third of the Site to Villaume Steel Company on March 4, 1968. Quality Metals has continued to own and operate a ferrous and non-ferrous metals and scrap iron business (at 2575 Doswell Avenue) up until the present.

Villaume Steel constructed the building now located at 2576 Doswell Avenue. Villaume Steel was engaged in steel shearing and coil leveling operations. Villaume Steel sold the property to Gate City Steel Corporation in 1977. Gate City Steel in turn sold the facility to Lapham-Hickey Steel in 1985. The building has continued to be used for steel fabricating.

3.3 Previous and Related Investigations

As noted earlier, E&E conducted a Site Investigation during June of 1987, at the former Valentine-Clark facility. E&E personnel interviewed Site representatives, observed Site conditions, and collected seven soil samples. Two samples were taken at a depth of four to six feet, and the remaining five samples were taken at the surface. The sample results showed that on-site soils are contaminated with pentachlorophenol and PAH compounds, and that these

contaminants are migrating off-site via Bridal Veil Creek. Soil sample S3, taken at the edge of Bridal Veil Creek, contained significant concentrations of several PAH hydrocarbons. All seven soil samples were found to have some contamination with PAHs and heavy metals. E&E concluded that it was highly probable that ground water beneath the Site is contaminated, due to the presence of soil contamination, and since the water table is shallow and located in a sand and gravel aquifer.

Lapham-Hickey Steel Corporation became aware of the potential that hazardous wastes were contaminating their property in April of 1987. Lapham-Hickey agreed to perform an environmental investigation to help determine the extent and magnitude of the suspected contamination. The firm of Yates & Auberle, Ltd., began a field investigation of the portion of the Valentine-Clark Site owned by Lapham-Hickey in September, 1988. Ten soil borings were drilled to collect subsurface soil samples, and eight monitoring wells were installed. Results of the laboratory analyses showed that soils and ground water are contaminated at various locations on the property with pentachlorophenol and PAH compounds. The findings of this investigation are summarized in a report completed on January 9, 1989. The laboratory results are attached to this report as Appendix J.

4.0 SITE INSPECTION FOLLOW-UP OBJECTIVES

The principal objectives of the SIF were to fill the existing data gaps in the initial Site Investigation (SI). The SI had determined that shallow surface soils were contaminated with pentachlorophenol and PAHs, indicative of spillage or on-site disposal of wood treating compounds. The SIF consisted of four soil

borings advanced to the water table, and the installation of three monitoring wells. The monitoring wells were installed to determine whether there was an observed release to ground water, in order to properly calculate a Hazard Ranking System score. Monitoring wells were necessary because there are no private or industrial wells in close proximity to the Site. Three monitoring wells allow determination of the ground water flow direction across the Site.

5.0 GEOLOGY

5.1 Regional Geology and Hydrology

The Valentine-Clark site is located in an upper river terrace of the Mississippi River Valley. The Quaternary deposits in the area of the Site are of fluvial or glaciofluvial origins. These unconsolidated deposits vary from 40 to 50 feet in thickness and consist of poorly sorted to graded silty sands and gravels with some interspersed, discontinuous clay layers (Norvitch and Walton,1979). Often a clay till layer separates the overlying sands and gravels from the underlying bedrock. A clay till layer may cause perched water conditions to exist in some areas. Generally, these unconsolidated terrace deposits do not provide significant ground water yields for a potable water source (Figure III).

The Decorah Formation (Decorah) is the first bedrock unit encountered in the vicinity of the Site (Appendix F). The Decorah formation is a greenish-gray, fissile, fossiliferous shale with interbedded, discontinuous limestone lenses. The Decorah is relatively thin (maximum recorded thickness 80 feet) to absent in the Twin Cities area due to erosion of the Mississippi River bedrock valley. Bedrock maps and well logs of the Site area indicate the Decorah is

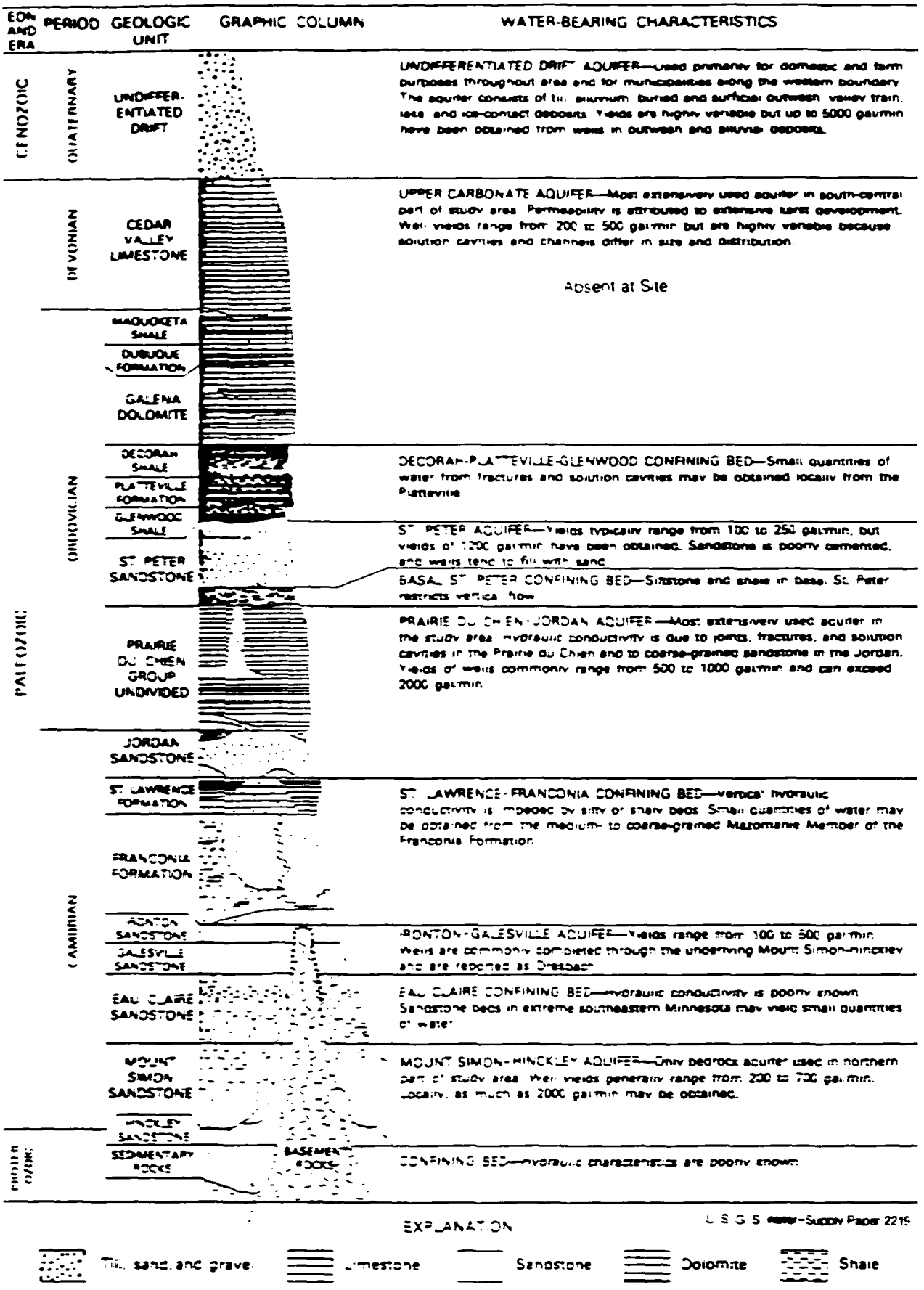

FIGURE III REGIONAL HYDROGEOLOGY STRATIGRAPHIC COLUMN

approximately 30 to 40 feet thick (Norvitch and Walton, 1979). Well logs indicate the Decorah is absent approximately one-quarter mile to the west to southwest of Site, while the unit is laterally extensive for more than two miles to the northeast. The presence of the Decorah often creates perched water conditions in the overlying unconsolidated deposits (Figure III).

Although, the Decorah formation is primarily an impermeable shale, areas where limestone lenses occur allow the Decorah formation to be utilized as an aquifer for limited domestic purposes (MPCA Files). The limestone lenses may also serve as conduits for ground water flow from the glacial overburden to the underlying Platteville formation (Sims and Morey, 1972).

The Platteville formation (Platteville) is the first primary water bearing bedrock unit underlying the Site. The Platteville is a yellowish-brown to buff colored dolomitic limestone (Figure III). The average thickness of the Platteville in the area is 30 to 40 feet. It is laterally extensive to the west for 1 1/2 miles until the Mississippi River intersects the formation and to the east within a 3-mile radius of concern. On a regional scale, the Platteville is included with the overlying Decorah formation and the underlying Glenwood formation to form one confining unit. But, on a local scale there are sedimentary and secondary structures present in each unit which allow for hydraulic interaction with under- and abovelying units (U.S.G.S Water-Supply Paper 2219, 1982).

The Glenwood formation (Glenwood) is a very thin (2 to 5 feet), grayish-green to yellow shale that separates the Platteville and St. Peter formations (Figure III). The Glenwood has no water-bearing capabilities on a regional scale but

lenses of of sandstone in some areas may allow for ground water interaction between the Platteville and St. Peter formations (Sims and Morey, 1972).

The St. Peter formation (St. Peter) is the first significant aquifer encountered on a regional scale. The St. Peter is a buff to white, fine-grained well-sorted orthoquartzite (Figure III). Well logs in the area indicate that the St. Peter is approximately 100 to 125 feet in thickness and capable of producing moderate ground water yields with a permeability range of 3.5 to 6.6 X 10-3 cm/sec. A basal shale and siltstone layer forms a confining bed between the St. Peter and the underlying Shakopee formation of the Prairie du Chien aquifer (Norvitch and Walton, 1979).

The regional ground water flow in the area is primarily influenced by two factors; the bedrock surface which slopes to the southwest and the Mississippi River which is west to southwest of the Site. The potentiometric surface of the St. Peter sandstone, the upper most primary aquifer, trends to the west to southwest in response to these influences. Locally ground water exists under unconfined conditions in the unconsolidated river terrace deposits and is often found as perched water due to discontinuous clay layers or the Decorah shale. Perched conditions may allow ground water to flow directions that vary from the regional trend (Norvitch and Walton, 1979).

5.2 Site Geology and Hydrology

The 4 soil borings (Figure II) taken indicate a layer of unconsolidated fill ranging from 4½ to 9 feet in thickness covers the majority of the Site. The fill was undifferentiated ranging from poorly graded fine sands with gravel to silts

and clays (Appendix F). The fill at borings B-1, B-2 and B-3 did not exhibit any evidence of contamination, as was expected since the fill was deposited after the Site was closed under the Valentine Clark Corporation. Borings B-1 and B-2 showed no evidence of waste deposition upon visual examination, although the silty sand was dark brown in B-1 and a fuel odor was noted. Boring B-3 exhibited some discoloration below the fill in the poorly graded fine sand and a slight fuel or creosote odor was noted. Boring B-4 contained dark brown to black sandy silt fill which appeared to be creosote stained. Peat deposits were found in the natural deposits below the fill. These organic deposits were most likely from a former bog or marsh which was subsequently filled (Figure IV). More detail is provided in well logs in Appendix F.

Ground water measurements taken prior to sampling of the wells indicate the ground water flow direction in the surficial aquifer to be to the southwest (Figure V). This is somewhat consistent with the water table direction mapped by Norvitch and Walton in 1979 which shows the gradient to be to the west in the Site area. Since these measurements were taken nearly 10 years apart, it is very likely that there has been a shift in the local surficial ground water flow direction. Due to the presence of the Decorah Shale at the Site, the ground water probably exists under perched conditions. The Decorah is also absent approximately ¼-mile downgradient from the Site. Therefore, the contaminants could flow along the top of the Decorah and enter the Platteville.

6.0 SURFACE WATER

Bridal Veil Creek (Creek) is the nearest surface water body at the Site. The creek is formed from run-off and storm drainage as it exits a culvert in the

northwest area of the Site (Figure II). The creek flows north to south along the western boundary of the Site before turning west and flowing into the Mississippi River through a series of culverts and surface flow areas. The surface water from Bridal Veil Creek flows approximately 1 and 1/2 miles before emptying into the Mississippi River.

The ground water at the Site and the surface water of Bridal Veil Creek are most likely interconnected. If this is the case then contaminants traveling via the ground water could contribute to surface water contamination.

7.0 FIELD PROCEDURES

7.1 On-Site Interview and Reconnaissance Survey

On-site interviews and a reconnaissance survey were conducted on April 21, 1988 with David Silverberg and Ben Silverberg to discuss current use of the Site by Quality Metals, Incorporated (QMI), any additional information not submitted with the Request for Information (RFI), and site access for the field work conducted during the SSI. Dave and Ben Silverberg could provide no significant information concerning past waste practices at the Site. They reaffirmed that QMI handles no hazardous substances or generates hazardous waste that are regulated under the Resource Conservation and Recovery Act (RCRA). David Silverberg indicated that any scrap metal and equipment could be moved to gain access to areas where soil borings and monitoring wells were to be placed. The MPCA staff informed both Ben and David Silverburg that it would be unnecessary for them to move any equipment or scrap piles to conduct the field investigation. Ben Silverberg inquired as to the availability of data after the

completion of the SSI field work. He was informed that "raw" data would be available upon completion of the data quality review, but no decisions concerning future actions at the Site would be made until the SSI report was finalized, approved by U.S. EPA, and an HRS scoring package was completed.

7.2 Soil Boring and Sampling Procedures

Four soil borings were advanced to the water table, three of which were used to install monitoring wells (Figure II). Borings B-1 thru B-3 were converted to monitoring wells, while B-4 was grouted to grade in accordance with the Minnesota Department of Health (MDH) Water Well Code, as the boring penetrated the water table.

A Central Mining Equipment model 55 truck-mounted drilling rig was used to advance 4¼-inch inner diameter hollow-stem auger (HSA) for soil borings and monitoring well installation. A 2-inch outer diameter split-spoon sampler was used to obtain soil samples in accordance to ASTM Standard D1586. The split-spoon samples were taken approximately every 5 feet. Split-spoon samples taken in the overlying fill that was deposited after the Site became inactive under the Valentine Clark Corporation were not submitted for pollutant analysis, but were used for geologic logs and cross-section construction (Figure IV). Due to the limited sample retainment of each split-spoon sample a sufficient quantity of soil could only be collected for a complete analysis of A/B/N, pesticides/PCBs, and metals under U.S. EPA CLP requirements. The VOAs soil samples were taken from the HSA cuttings as they exited the borehole. Although collection of soil samples from auger cuttings as they exit the borehole does not allow for a discrete analysis of a given interval, it was chosen due to the

aforementioned field conditions and prior information concerning contamination by PAH compounds at the Site.

All quidelines established by the MPCA Quality Assurance Protection Program (QAPP) and the U.S. EPA Contract Laboratory Program were used during collection of the soil samples. The samples collected for Target List Compounds (TLC) analysis were sent to Keystone Environmental Resources, Houston, Texas. The samples collected for Target List Analytes (TLA) analysis were shipped to Chemtech Consulting Group in New York, New York. All samples were analyzed under Routine Analytical Services (RAS).

All monitoring wells and borings were surveyed to the nearest hundredth foot. A fire hydrant at the northwest intersection of Doswell Avenue and the railroad tracks was established as a benchmark (Figure II). City of St. Paul survey records indicate that the fire hydrant's elevation is 884.64 feet M.S. For further detailed descriptions of drilling, split-spoon sampling, geological logs, and surveying see Appendix F.

7.3 Soil Boring and Sampling Locations

The soil boring locations were chosen based primarily upon aerial photographs of the Site taken in 1945, 1958, 1962 and correspondence with a former Valentine Clark Corporation employee (MPCA files). As described in Section 3.2, the aerial photographs revealed the majority of the wood pole treatment activity had taken place on the southern third of the original property, which is currently owned by Lapham-Hickey Steel Corporation (LHSC) (Figure II). Former locations of wood treatment tanks, buildings, roads, wood storage areas, railroad tracks were

also identified from the aerial photographs. An earlier, 1927 Sanborn Insurance map indicated a smaller pole treatment facility was operated in the same location as the present site of the QMI building, but was removed by the time aerial photographs were taken of the area in 1945. The wood pole treatment tanks were considered to have the greatest contamination potential, as aerial photographs indicated a high degree of soil staining from spillage of fuel oil containing creosote and pentachlorophenol.

A former employee was not aware that any wood treatment waste was transported off the property, but could not prove or disprove it was disposed of at the Site (MPCA files). The aerial photographs show a swampy area in the northwestern part of the Site that would be the most likely area of dumping. The remaining open area was used as storage for both treated and untreated poles.

Soil borings B-1, B-2, and B-4 were placed in areas where wood storage and suspected waste dumping had occurred (Figure II). Boring B-3 was placed in the southwestern part of the Site at the closest property boundary of the adjacent LHSC of the Site . Soil borings could not be placed in the former location of the smaller treatment facility due to the present location of QMI building.

7.4 Monitoring Well Installation

Three monitoring wells were installed in accordance with the Minnesota Water Well Code. Wells were used to determine the local ground water flow direction in the surficial aquifer and to obtain ground water samples. Two inch stainless steel casing was used for riser material and 10 feet, 10 slot stainless steel screens were set 5 to 7 feet below the water table (Appendix F). A flint sand

was used as filter pack material and extended 1 foot above the top of the screen. 1 foot bentonite slurry was placed between the filter pack and the neat cement grout to prevent intrusion of the grout into the filter pack. The final 2 feet of annulus space was filled with Portland cement and a 4 inch diameter, 3 feet long galvanized protective casing with locking cap was placed atop the well riser for security. Three, 4 inch diameter galvanized steel posts were placed around the well as a protective measure against heavy equipment or vehicular traffic. For diagrams and further information concerning well construction consult Appendix F.

7.5 Ground Water Sampling

Precision Environmental Services, Incorporated developed and stabilized the monitoring wells on July 19, 1988. A 2 inch submersible pump was used to draw water from the wells. The wells were stabilized through monitoring of ground water temperature, conductivity, and pH. A full report of well development and stablilization is provided in Appendix G.

MPCA staff sampled the monitoring wells on July 25 and 26, 1988. A 2 liter stainless steel bailer was used to extract water from the monitoring wells. Approximately 20 well volumes of ground water were drawn from each well prior to sampling to insure representative samples were obtained. All guidelines established by the MPCA QAPP and the U.S. EPA Contract Laboratory Program were used during collection of the ground water samples. The samples collected for Target List Compounds (TLC) analysis were sent to PEI Associates in Cincinnati, Ohio. The samples collected for Target List Analytes (TLA) analysis were shipped to Environmental Protection Systems in Pensacola, Florida. All samples

were analyzed under RAS.

7.6 Surface Water and Sediment Sampling

Surface water samples were taken on July 25 and 26, 1989 and forwarded to same respective CLP laboratories as the ground water samples. Surface water samples were collected by submersing a sampling bottle beneath the water's surface and allowing the bottle to fill. Water collected for the metals analysis was filtered through a .45 micron in-line filter before being funneled into the appropriate sampling container. Surface water sample were analyzed by the same respective inorganic and organic CLP laboratories as the ground water samples. As with the ground water samples, all surface water samples were analyzed under RAS.

Stream sediment samples were collected at upstream and downstream locations on June 23, 1989 (Figure II). Surface sediment samples were collected with a stainless steel scoop and immediately placed in appropriate sampling containers. All measures were taken to insure sample integrity, as detailed in the MPCA QAPP and U.S. EPA Contract Laboratory Program. The sediment samples were sent to the same inorganic and organic CLP laboratories as the soil boring samples and analyzed under RAS.

7.7 Surface Water and Surface Sediment Locations

Two surface water samples and two stream sediment samples were taken from Bridal Veil Creek. Sample SW-1 was taken at the point at which the stream is formed as it exits the culvert (Figure II). SW-1 is considered to be the background

sample used to establish ambient surface water quality. The use of this sampling point as a background sample may be questionable, as the stream is formed by drainage water from an industrialized area and storm drain run-off upstream of the Site . Sample SW-2 was taken at a location after the surface water had flowed through the Site, in an effort to determine potential impact from the Site to surface water (Figure II).

8.0 ANALYTICAL RESULTS

Chemical analysis results of MPCA - obtained soil samples are presented in Tables I and II. Laboratory results for nearly all of the soil samples included common laboratory artifacts and common soil constituents. Three soil samples, S04, S05, and S15, had detectable concentrations of compounds associated with wood treating wastes (PAHs and pentachlorophenol). Samples S04, S05, and S15 were obtained from Bridal Veil Creek, soil boring B-1, and soil boring B-4, respectively. For a listing of all soil samples with location, depth, and type of sample, please refer to Table V.

Sample S04 was obtained at a downstream location along the east bank of Bridal Veil Creek. The stream bank is obviously stained with oil and/or creosote, with a shiny, black appearance. Readings of approximately twenty to twenty-five needle deflection units were observed on an HNu portable photoionizer, when the tip of the probe was placed over a clump of sediment scraped from the stream bank. Not surprisingly, significant concentrations of PAH compounds and pentachlorophenol were detected. The concentration of pentachlorophenol was 2,200,000 ug/kg, and the concentrations of eight known PAHs ranged from 120,000 ug/kg for acenaphthene to 5,500,000 ug/kg for phenanthrene.

Table I

Summary of Chemical Analysis for
Valentine Clark Soils - Organics

Sample Collection Information and Detected Parameters	Sample Number S03	S04	S05	S06	S07	S08	S09	
Date:	6-23-88	6-23-88	6-21-88	6-21-88	6-21-88	6-21-88	6-22-88	
Time:	1115	1120	1205	1255	1305	1315	930	
Organic Traffic Report Number	ECE05	ECE06	ECE07	ECE08	ECE09	ECE10	ECE11	
Inorganic Traffic Report Number	MECD44	MECD45	MECD46	MECD47	MECD48	MECD49	MECD50	
Compound Detected (ug/kg)								
methylene chloride	64	120	72				17	
xylene		9						
acetone	15	210	23				74	
beta-BHC	62		15					
heptachlor			3.6J					
bis (2-ethylhexyl) phthalate				360	640	120J		
acenaphthene		120,000						
fluorene		270,000						
pentachlorophenol		2,200,000						

J- Indicates an estimated value

Table I (continued)

Sample Collection Information and Detected Parameters	Sample Number S03	S04	S05	S06	S07	S08	S09	
Compounds Detected (ug/kg)								
phenanthrene		5,500,000						
anthracene		430,000						
benzo (k) fluoranthene			430					
fluoranthene		350,000	730					
benzo (a) pyrene			370					
pyrene		1,600,000	770					
benzo (a) anthracene		130,000	380					
chrysene		220,000	400					

Table I (continued)

Summary of Chemical Analysis for
Valentine Clark Soils - Organics

Sample Collection Information and Detected Parameters	Sample Number S10	S11	S12	S13	S14	S15	S16	S17
Date:	6-22-88	6-22-88	6-22-88	6-22-88	6-22-88	6-23-88	6-23-88	6-23-88
Time:	948	1320	1330	1340	1400	1005	1015	1025
Organic Traffic Report Number	ECE12	ECE13	ECE14	ECE15	ECE16	ECE17	ECE18	ECE19
Inorganic Traffic Report Number	MECD51	MECD52	MECD53	MECD54	MECD55	MECD56	MECD57	MECD58
Compound Detected (ug/kg)								
methylene chloride		16				17		
acetone		77				44		
bis(2-ethylhexyl) phthalate	250J	150J	110J	300J			430J	
phenanthrene						770J	180J	
anthracene						890J		
fluoranthene						5200		
pyrene						10,000		
benzo (a) anthracene						3600		
chrysene						6900		

J- Indicates an estimated value

Table I (continued)

Sample Collection Information and Detected Parameters	Sample Number S10	S11	S12	S13	S14	S15	S16	S17
Compounds Detected (ug/kg)								
benzo(b)fluoranthene						6400		
benzo(k)fluoranthene						4200		
benzo(a)pyrene						3800		
indeno(1,2,3-cd)pyrene						2100J		
dibenz(a,h)anthracene						820J		
benzo(g,h,i)perylene						1800J		

J - Indicates an estimated value

Table II
Summary of Chemical Analysis for
Valentine Clark Soils - Inorganics

Sample Collection Information and Detected Parameters	Sample Number S03	S04	S05	S06	S07	S08	S09	
Date:	6-23-88	6-23-88	6-21-88	6-21-88	6-21-88	6-21-88	6-22-88	
Time:	1115	1120	1205	1255	1305	1315	930	
Organic Traffic Report Number	ECE05	ECE06	ECE07	ECE08	ECE09	ECE10	ECE11	
Inorganic Traffic Report Number	MECD44	MECD45	MECD46	MECD47	MECD48	MECD49	MECD50	
Compound Detected (ug/kg)								
Aluminum	2470	4900	4230	5900	1320	1410	4670	
Arsenic	1.2B	16	2.5	1.3B	1.1B			
Barium	73	78	65	26B	14B	28B	24B	
Beryllium		0.55B	0.51B	0.65B	0.51B		0.45B	
Cadmium	4.0	6.3	2.2	2.8	1.5	1.4	1.2	
Calcium	12700	12600	1930	1510	1150	13700	1080B	
Chromium	16	13	9.1	11	4.2	5.2	13	
Cobalt	3.9B	3.3B	3.9B	4.0B	2.7B	4.9B	1.9B	
Copper	20	87	17	21	9.3	33	11	
Iron	11600	18200	8140	8860	3830	5580	5100	
Lead	85	47	9.3	3.3	1.6	1.6	1.3	

B - Indicates concentration less than Contract Required Detection Limit, but greater than Instrument Detection Limit

Table II (continued)

Sample Collection Information and Detected Parameters	Sample Number S03	S04	S05	S06	S07	S08	S09	
Compounds Detected (ug/kg)								
Magnesium	5790	4000	1270	1400	673B	6030	10400B	
Manganese	1150	149	372	238	181	357	100	
Mercury		0.71						
Nickel	17	16	6.7B	9.3	3.6B	7.0B	5.8B	
Potassium	1190B	2620B	2340B	2250B				
Sodium	3200B	4280B	2580B	2590B	2590B	2860B	244	
Thallium		5.9						
Vanadium	11B	13	14	19	7.4B	8.9B	13	
Zinc	64	112	34	20	12	17	16	

B - Indicates concentration less than Contract Required Detection Limit, but greater than Instrument Detection limit

Table II (continued)

Summary of Chemical Analysis for
Valentine Clark Soils - Inorganics

Sample Collection Information and Detected Parameters	Sample Number S10	S11	S12	S13	S14	S15	S16	S17
Date:	6-22-88	6-22-88	6-22-88	6-22-88	6-22-88	6-23-88	6-23-88	6-23-88
Time:	948	1320	1330	1340	1400	1005	1015	1025
Organic Traffic Report Number	ECE12	ECE13	ECE14	ECE15	ECE16	ECE17	ECE18	ECE19
Inorganic Traffic Report Number	MECD51	MECD52	MECD53	MECD54	MECD55	MECD56	MECD57	MECD58
Compound Detected (ug/kg)								
Aluminum	1990	4890	6000	1620	1730	6760	3010	2950
Arsenic			0.80B	2.4			2.6	3.8
Barium	16B	48	63	22B	9.5B	59	120	25B
Beryllium		0.53B	0.58B		0.48B	0.60B	1.7	0.54B
Cadmium	1.3	2.1	2.7	2.1	1.6	3.3	4.4	2.0
Calcium	1150B	23400	1430	12500	13400	8680	35,400	26,900
Chromium	6.1	11	12	5.6	6.1	12	8.6	10
Cobalt	3.6B	5.4B	4.6B	3.7B	3.8B	5.6B	5.2B	32
Copper	11	17	43	8.9	14	30	38	14
Iron	5110	9450	8740	5210	5610	11100	3060	6390
Lead	15	31	3.5	2.3	2.0	4.0	4.2	1.6

B - Indicates concentration less than Contract Required Detection Limit, but greater than Instrument Detection Limit

Table II (continued)

Sample Collection Information and Detected Parameters	Sample Number S10	S11	S12	S13	S14	S15	S16	S17
Compounds Detected (ug/kg)								
Magnesium	7928	11800	1190	6290	4220	3660	5630	9050
Manganese	139	144	269	175	78	248	235	191
Mercury								
Nickel	3.9B	14	7.3B	6.2B	8.4	14	9.6	50
Potassium	650	3308	2078	1278		2078	4358	1488
Sodium	2668	3518	2828	3228	2888	3848	1170	3238
Thallium							6.1	
Vanadium	10B	14	25	7.6B	13	22	8.4B	14
Zinc	12	57	29	14	14	31	34	24

B - Indicates concentration less than Contract Required Detection Limit, but greater than Instrument Detection Limit

Sample S05 was obtained at a depth of five to seven feet deep in soil boring B-1, in the northwest portion of the Site (see Figure II). The laboratory results indicated contamination with six known PAHs, ranging from 370 ug/kg for benzo (a) pyrene to 770 ug/kg for pyrene. PAHs were not detected at any of the other intervals in soil boring 1. It is possible that the former soil surface was approximately at this depth, since sandy fill material was placed over much of the Valentine Clark property, at between 4½ and 9 feet deep, after the facility closed down. Creosote residues from wood treating may have been spilled or deposited on the ground at this location. The PAH compounds apparently have not traveled downward, since soil samples obtained at greater depths in soil boring B-1 (S06, S07, and S08) did not have detectable levels of PAHs.

Soil boring B-4 is similar in that the material from five to seven feet deep, in sample S15, also contained PAHs. Twelve known PAH compounds were detected, at concentrations ranging from 770 ug/kg (estimated) of phenanthrene to 10,000 ug/kg of pyrene. A distinct zone of dark, creosote-stained soils was apparent as the drilling auger shavings from this depth were being spun out onto the ground. The appearance of fill-like sands between zero and five feet indicates that the stained soils were probably the former ground surface here as well. Soils obtained at deeper intervals in this boring were free of PAH contamination.

Chemical analysis results of MPCA obtained water samples are presented in Tables III and IV. All of the water samples contained common laboratory artifacts and commonly occurring metals and heavy metals. In addition, the three monitoring wells contained low concentrations of various halogenated and non-halogenated

Table III

Summary of Chemical Analysis for
Valentine Clark Surface Water Samples - Organics

Sample Collection Information and Detected Parameters	Sample Number Downstream (S01)	Upstream (S02)	Duplicate (D01)	Travel Blank
Date:	7-26-88	7-26-88	7-26-88	7-26-88
Time:	1425	1340	1425	1500
Organic Traffic Report Number	ECE01	ECE03	ECE02	ECE04
Inorganic Traffic Report Number	MECD41	MECD43	MECD42	----
Compound Detected (ug/L)				
methylene chloride	1 BJ	10 B	1 BJ	2 BJ
acetone	2 BJ	3 BJ	34 B	
di-n-butylphthalate		4 BJ	8 BJ	

B - Indicates compound detected in one or more blanks

BJ - Indicates estimated concentration because detected in one or more blanks and not sufficiently higher than blank concentration

Table III (continued)

Summary of Chemical Analysis for
Valentine Clark Monitoring Well Samples - Organics

Sample Collection Information and Detected Parameters	Sample Number MW1 (S18)	MW2 (S19)	MW3 (S20)	Duplicate (D20)	Travel Blank	Field Blank
Date:	7-25-88	7-26-88	7-26-88	7-26-88	7-26-88	7-26-88
Time:	1105	1255	900	905	1500	1215
Organic Traffic Report Number	ECE20	ECE21	ECE22	ECE23	ECE04	ECE24
Inorganic Traffic Report Number						
Compound Detected (ug/L)						
methylene chloride	2 BJ	3 BJ	3 BJ		2 BJ	
acetone		3 BJ		3 BJ		7 BJ
1,1-dichloroethene		1J				
1,1-dichloroethane			4J	3J		
chloroform						3J
1,1,1-trichloroethane			8	7		
trichloroethene		1J				
tetrachloroethene	1J	3J	2J			

J - Indicates compound detected but concentration estimated due to QC problems

BJ - Indicates estimated concentration because detected in one or more blanks and not sufficiently higher than blank concentration

Table III (continued)

Sample Collection Information and Detected Parameters	Sample Number MW1 (S18)	MW2 (S19)	MW3 (S20)	Duplicate (D20)	Travel Blank	Field Blank
Compounds Detected (ug/L).						
toluene		1J				
chlorobenzene		1J				
ethylbenzene		1J				
xylene		1J				
di-n-butylphthalate		4 BJ	22B			4 BJ
bis 2-ethylhexylphthalate	1J		2J			
pentachlorophenol			19J	25J		
butylbenzylphthalate			3J			

B - Compound detected in one or more blanks

J - Indicates compound detected but concentration estimated due to QC problems

BJ - Indicates estimated concentration because detected in one or more blanks and not sufficiently higher than blank concentrations

Table IV

Summary of Chemical Analysis for
Valentine Clark Surface Water Samples - Inorganics

Sample Collection Information and Detected Parameters	Sample Number Downstream (S01)	Upstream (S02)	Duplicate (D01)	Travel Blank
Date:	7-26-88	7-26-88	7-26-88	7-26-88
Time:	1425	1340	1425	1500
Organic Traffic Report Number	ECE01	ECE03	ECE02	ECE04
Inorganic Traffic Report Number	MECD41	MECD43	MECD42	----
Compound Detected (ug/L)				
Aluminum				
Barium	115B	119B	117B	
Calcium	70,600	71,000	70,700	
Chromium				
Magnesium	26,300	26,500	26,300	
Manganese	75	178	75	
Nickel				
Potassum		2810B		
Selenium				
Sodium	11,500	11,000	11,400	
Zinc	14B	11B	10B	

B - Indicates concentration less than Contract Required Detection Limit, but greater than Instrument Detection Limit

Table IV (continued)

Summary of Chemical Analysis for
Valentine Clark Monitoring Well Samples - Inorganics

Sample Collection Information and Detected Parameters	Sample Number MW1 (S18)	MW2 (S19)	MW3 (S20)	Duplicate (D20)	Travel Blank	Field Blank
Date:	7-25-88	7-26-88	7-26-88	7-26-88	7 26-88	7 26-88
Time:	1105	1255	900	905	1500	1215
Inorganic Traffic Report Number	MECE04	MECE05	MECE06	MECE07		MECE08
Compound Detected (ug/L)						
Aluminum	141B					
Barium	79B	86B	184B	181B		
Calcium	98,100	103,000	166,000	165,000		
Chromium		5B		5B		
Magnesium	25,500	28,700	50,100	50,700		
Manganese	49	33	2400	2340		
Nickel			22B	22B		
Potassium		3440B	4070B	2490B		
Selenium	3B	3B				
Sodium	21,000	20,900	34,800	34,800		
Zinc	10B	11B	9B	9B		9B

B - Indicates concentration less than Contract [illegible]uired Detection Limit, but greater than [illegible]rument Detection Limit

Table V
Descriptions of Soil and Sediment Samples

Sample #	Traffic Report #	Location	Depth	Composite	Grab
S03	ECE05/MECD44	Upstream sediment Bridal Veil Creek	Surface		X
S04	ECE06/MECD45	Downstream sediment Bridal Veil Creek	Surface		X
S05 (VOAs)	ECE07/MECD46	Soil boring 1	0-5', 5'-10' 10'-15', 15'-20'	X	
S05 (others)	ECE07/MECD46	Soil boring 1	5'-7'		X
S06	ECE08/MECD47	Soil boring 1	10'-12'		X
S07	ECE09/MECD48	Soil boring 1	15'-17'		X
S08	ECE10/MECD49	Soil boring 1	20'-22'		X
S09 (VOAs)	ECE11/MECD50	Soil boring 2	0-5', 5-10' 10'-15'	X	
S09 (others)	ECE11/MECD50	Soil boring 2	5'-7'		X
S10	ECE12/MECD51	Soil boring 2	10'-12'		X
S11 (VOAs)	ECE13/MECD52	Soil boring 3	0-5', 5'-10' 10-15',15-20'	X	
S11 (others)	ECE13/MECD52	Soil boring 3	5'-7'		X
S12	ECE14/MECD53	Soil boring 3	10'-12'		X
S13	ECE15/MECD54	Soil boring 3	15'-17'		X
S14	ECE16/MECD55	Soil boring 3	20'-22'		X
S15 (VOAs)	ECE17/MECD56	Soil boring 4	0-5', 5-10' 10'-15'	X	
S15 (others)	ECE17/MECD56	Soil boring 4	5'-7'		X
S16	ECE18/MECD57	Soil boring 4	10'-12'		X
S17	ECE19/MECD58	Soil boring 4	15'-17'		X

Table VI

Descriptions of Water Samples

Sample #	Traffic Report #	Location
S01	ECE01/MECD41	Downstream surface sample Bridal Veil Creek
D01	ECE02/MECD42	Duplicate-downstream surface Bridal Veil Creek
S02	ECE03/MECD43	Upstream surface sample Bridal Veil Creek
S18	ECE20/MECE04	Monitoring Well 1
S19	ECE21/MECE05	Monitoring Well 2
S20	ECE22/MECE06	Monitoring Well 3
D20	ECE23/MECE07	Duplicate-Monitor Well 3
R01	ECE04	Travel Blank (VOAs only)
R02	ECE24/MECD08	Field Blank

hydrocarbons. Both samples from monitoring well MW-3 (samples S20 and D20) were contaminated with pentachlorophenol.

Although the stream banks along Bridal Veil Creek were contaminated with wood treating wastes, those compounds were not detected in the creek surface water samples. Both the upstream and downstream samples were found to contain common laboratory artifacts and common metals and heavy metals.

For a listing of water samples obtained at the Valentine-Clark Site with locations, as well as a listing of duplicate and blank samples, please refer to Table VI.

The concentrations of pentachlorophenol detected in well MW-3 (19 and 25 ug/L) are well below the Minnesota Health Department's Recommended Allowable Limit (RAL) of 220 ug/L. The concentrations of halogenated and non-halogenated hydrocarbons in wells MW-1, MW-2 and MW-3 are also below RALs and U.S. EPA Maximum Contaminant Levels (MCLs). Nevertheless, these compounds do indicate a release of contaminants to ground water at the Site.

9.0 MIGRATION PATHWAYS

9.1 Ground Water

An observed release to ground water has been documented in the unconsolidated drift deposits beneath the Site (Tables I to IV). Three hydrogeologic factors could encourage further contaminant migration into the bedrock aquifer system; 1) the Decorah shale is not completely impermeable in certain areas due to its

friable nature and interspersed limestone lenses, 2) the Decorah has also been eroded approximately ½-mile downgradient from the Site, which could allow contaminated ground water from the surficial aquifer to flow along the top of the Decorah and enter the Platteville limestone, and 3) the Glenwood shale which underlies the Platteville is characterized by sandstone layers which could contribute to contaminant migration into the St. Peter sandstone.

Since the potential for aquifer interconnection exists between the three upper water-bearing units, the unconsolidated drift, the Platteville limestone, and the St. Peter sandstone, these units are designated as the "aquifer of concern". These three units and the semi-confining layers have a total thickness of 259 at the Site (Norvitch and Walton, 1979).

The ground water within a 3-mile radius of the Site is used only for industrial purposes, so there are no human population targets consuming the ground water.

9.2 Surface Water

Bridal Veil Creek serves as a conduit for surface water contaminants that may leave the Site via the ground water migration pathway (Figure V) or through leachate generated in the unsaturated zone along the stream bank. Although contaminants characteristic of wood treatment facilities were detected in the ground water and the soil leachate sample, the downstream surface water sample (Figure II) detected no contamination leaving the Site via Bridal Veil Creek.

If the downstream surface water was erroneous and contaminants are migrating from the Site via the surface water pathway to the Mississippi River, there are

no surface water intakes within three miles. Therefore, there are no human population targets under the surface water migration pathway.

9.3 Air

Air monitoring was conducted at the Site during drilling and surface sediment and water sampling with a HNu photoionization meter (HNu). PAH compounds do not readily volatilize therefore, registration on the HNu was not expected. However, sufficient quantities of acetone and methylene chloride were present within 2 feet of the leachate area along Bridal Veil Creek to be detected by the HNu (Tables I and V). Since the stream bank can be easily accessed there is a potential for exposure at close range (within 100 feet) in the air migration pathway through vapor or wind blown particles from the leachate area.

9.4 Fire and Explosion

Due to coverage of the Site by fill material there is no apparent potential for a fire or an explosion (MPCA files).

9.5 Direct Contact

The potential for direct contact with TCL compounds exists along the bank of Bridal Veil Creek where leachate is present and access is unrestricted. The Site is in an industrial area and the leachate is originating from the stream bank, so traffic is low in this area of the Site. Minnesota Population and Household Estimates for 1987 account for 3227 residents living within a 1-mile radius of the Site.

10.0 CONCLUSIONS

The Site Investigation Follow-up conducted by the Minnesota Pollution Control Agency staff at the Valentine-Clark Corporation Site found that soils, sediments, and ground water are contaminated with wood treating wastes (PAH compounds, volatile organic hydrocarbons, and pentachlorophenol). However, the potential impacts of these contaminants on human health are limited because the wastes have generally been covered by several feet of fill material, the wastes do not readily migrate in ground water, and ground water and surface water in the vicinity of the Site is not used for drinking. The contaminated soils and sediment along the banks of Bridal Veil Creek are a source of environmental degradation, but do not directly threaten human health.

11.0 REFERENCES

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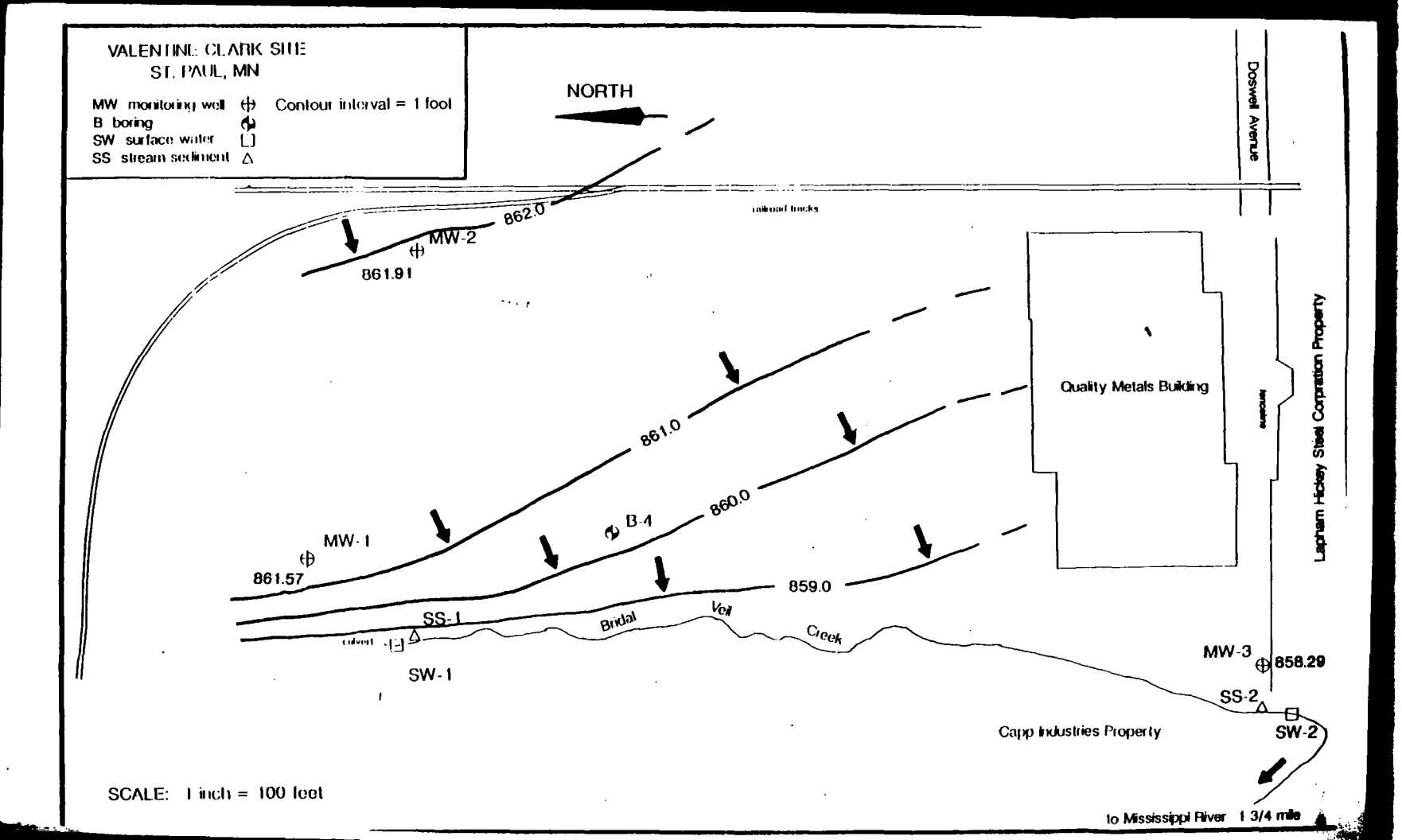
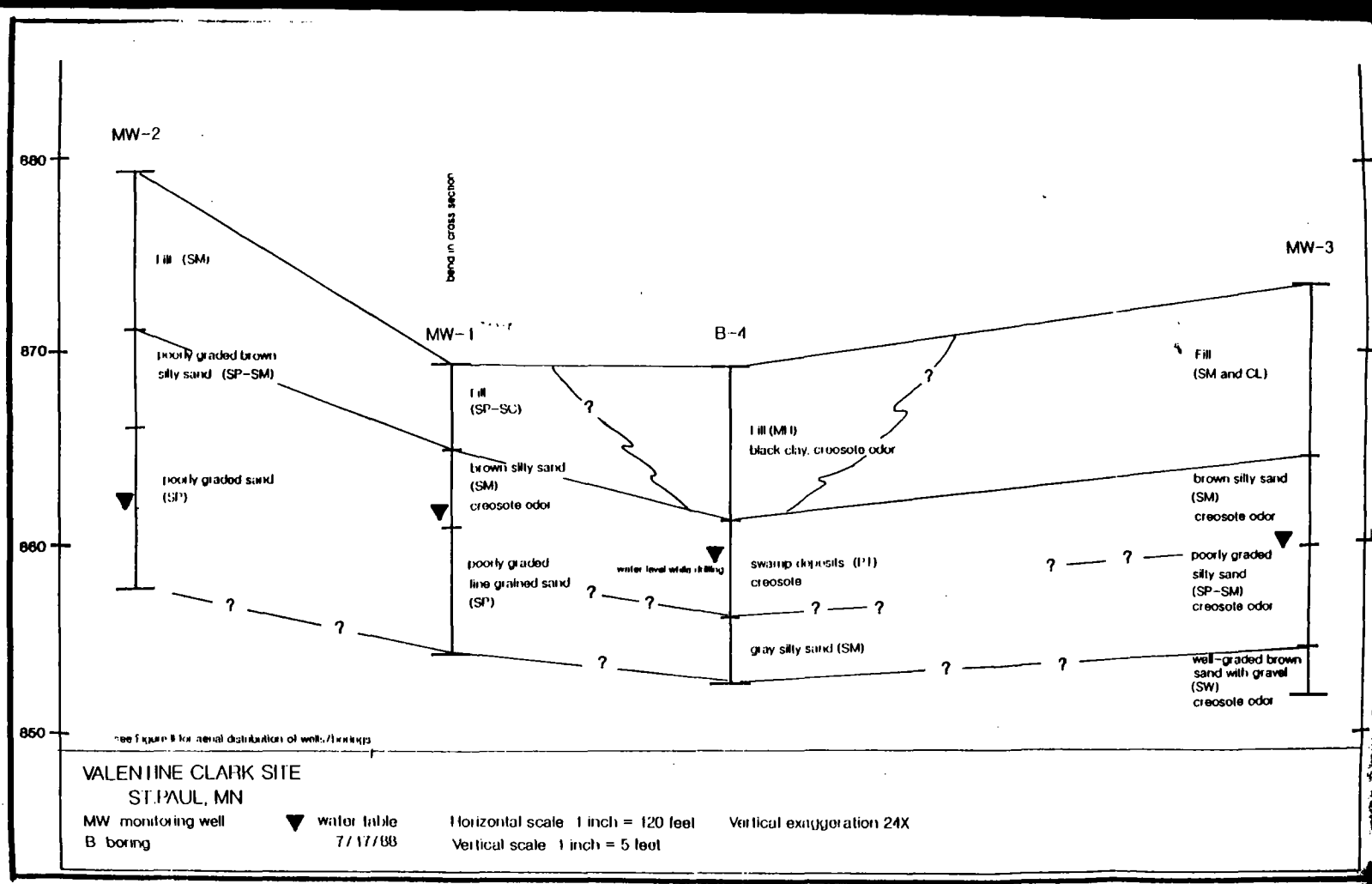
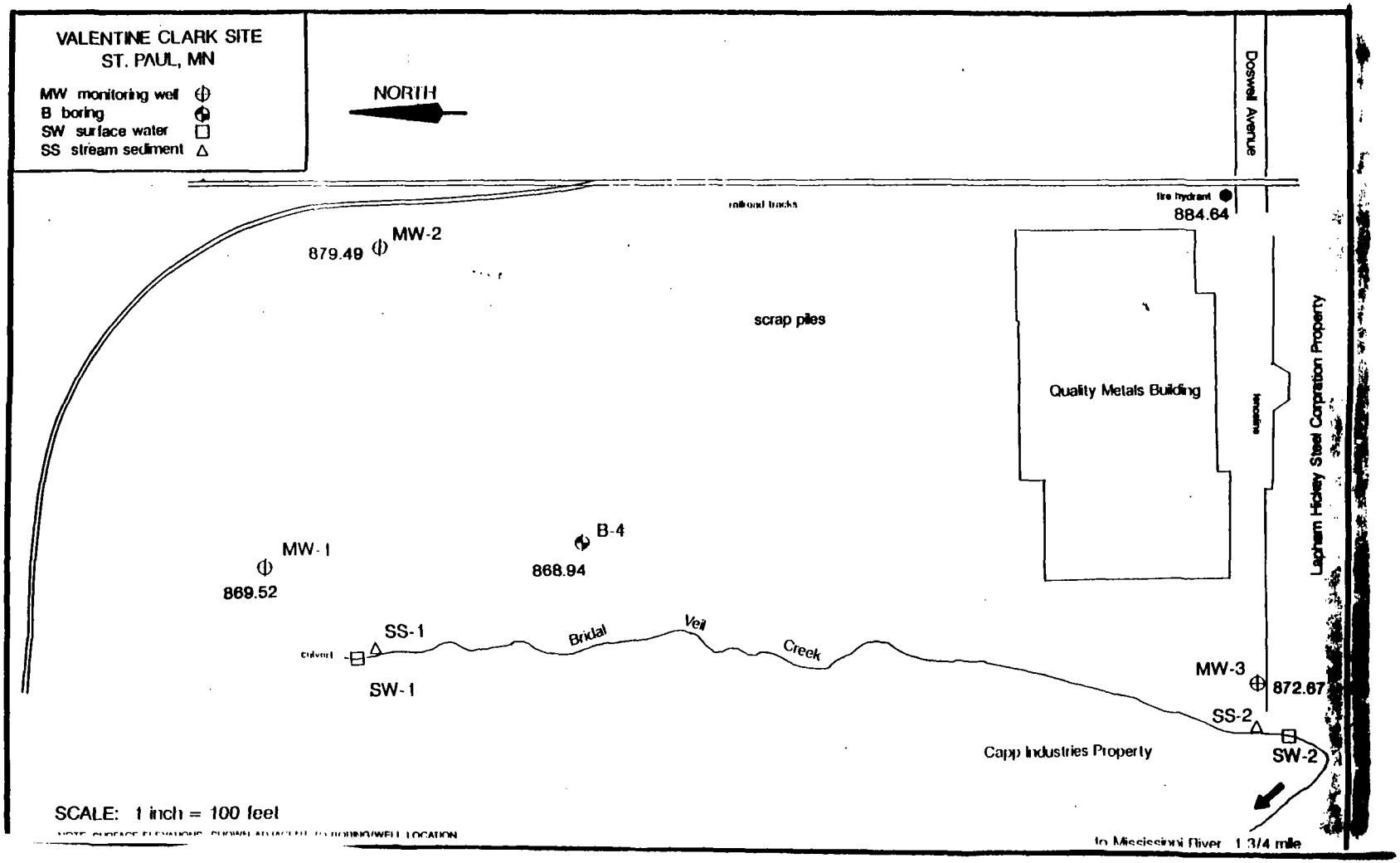
5. Sims, P.K., and Morey, G.B., Geology of Minnesota, A Centennial Volume, 1972.

6. Site Inspection Report for Valentine-Clark Corporation, St. Paul, Minnesota, Ecology and Environment, Inc., 1987.


VALENTINE CLARK SITE
ST. PAUL, MN
MW monitoring well
B boring
SW surface water
SS stream sediment
Contour interval = 1 foot
NORTH
Doswell Avenue
railroad tracks
862.0
MW-2
861.91
861.0
860.0
859.0
MW-1
861.57
B-4
SS-1
SW-1
culvert
Bridal Veil Creek
Quality Metals Building
Lapham Hickey Steel Corpration Property
MW-3
858.29
SS-2
SW-2
Capp Industries Property
SCALE: 1 inch = 100 feet
to Mississippi River 1 3/4 mile


MW-2
MW-1
B-4
MW-3
880
870
860
850
bend in cross section
Fill (SM)
poorly graded brown silty sand (SP-SM)
poorly graded sand (SP)
Fill (SP-SC)
brown silty sand (SM) creosote odor
poorly graded fine grained sand (SP)
water level while drilling
Fill (Mf) black clay, creosote odor
swamp deposits (Pt) creosote
gray silty sand (SM)
Fill (SM and CL)
brown silty sand (SM) creosote odor
poorly graded silty sand (SP-SM) creosote odor
well-graded brown sand with gravel (SW) creosote odor
see figure 8 for aerial distribution of wells/borings
VALENTINE CLARK SITE
ST.PAUL, MN
MW monitoring well
B boring
water table 7/17/88
Horizontal scale 1 inch = 120 feet
Vertical scale 1 inch = 5 feet
Vertical exaggeration 24X


VALENTINE CLARK SITE
ST. PAUL, MN
MW monitoring well
B boring
SW surface water
SS stream sediment
NORTH
Doswell Avenue
railroad tracks
fire hydrant
884.64
879.49
MW-2
scrap piles
Quality Metals Building
fences
Lapham Hickey Steel Corpration Property
B-4
868.94
MW-1
869.52
SS-1
culvert
Bridal Veil Creek
SW-1
MW-3
872.67
SS-2
SW-2
Capp Industries Property
SCALE: 1 inch = 100 feet
to Mississippi River 1 3/4 mile